



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|----------------------|
| 10/618,141 | 07/10/2003 | Dong-Ho Oh | 139-025U | 4443 |
| 23429 | 7590 | 01/25/2005 | EXAMINER | |
| GREGORY SMITH & ASSOCIATES 3900 NEWPARK MALL ROAD, 3RD FLOOR NEWARK, CA 94560 | | | | HABERMEHL, JAMES LEE |
| ART UNIT | | PAPER NUMBER | | |
| 2651 | | | | |

DATE MAILED: 01/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|-------------------------------|------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 10/618,141 | OH ET AL. |
| | Examiner James L Habermehl | Art Unit 2651 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 10 July 2003 and 24 November 2003.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-22 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-6, 11-19 and 22 is/are rejected.
 7) Claim(s) 7-10, 21 and 22 is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>24 Nov 03</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ |

1. This Office action is in response to papers filed 10 July 2003 and 24 November 2003, which papers have been placed of record in the file.
2. The drawings are objected to because in Figure 11C the initial position of the track on the unflexed disk is labeled "B1" when it should be --B0--. Also, the examiner questions whether the labels "B1" and "B0" in Figures 3B and 11B should be swapped. Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
 - (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 6, 11-12, and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al. Zhang et al. Figures 9, 12, and 15 show means and method for reducing a gain of a PES within a disk vibration frequency range and gives an example frequency of 1.8kHz (paragraphs 0054-0056), and show means and method for increasing said gain of said PES within a lower frequency range and gives an example frequency range of 10 to 300Hz (paragraphs 0057-0060). Figure 15 shows an embodiment with both the above means disclosed together. Zhang et al. Figure 1 further discloses said voice coil motor (118) drives an actuator arm (114) positioning a head gimbal assembly (disk head slider 110) for a read-write head communicatively accessing a track on a rotating disk surface (106) to generate said PES (p. 2, paragraph 0026). The functional recitation that "wherein said PES is a function of said head gimbal assembly responding to mechanical vibrations in said rotating disk surface by providing said read-write head with radial motion toward said track" must necessarily be provided by the structure of Zhang et al. which meets all the structural limitations present in the claim.

Zhang et al. does not explicitly disclose the specific ranges of between at least 1000Hz and at most 3000Hz and between at least 16Hz and at most 800Hz as claimed. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the

system of Zhang et al. to use the claimed ranges, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 11, Zhang et al. paragraph 0064 discloses implementation in either hardware or software, which comprises at least a program step residing in a memory accessibly coupled to said computer and hence meets the additional limitations of the claim. Regarding claims 17-18, the additional method of making and product limitations of these claims are met for the same reasons as given above regarding their corresponding method claim 12.

5. Claims 2-5 and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al. as applied to claims 1 and 12 above. Zhang et al. Figure 15 and paragraph 0061 show plural means and steps for increasing gains within a lower frequency range. Zhang et al. does not explicitly disclose the specific frequency ranges of the first being lower than the second or the specific gains of the first being larger than the second as claimed, specifically at least 1.5 times larger as claimed in claims 4 and 15 and at least 2 times larger as claimed in claims 5 and 16, and that the second gain is between 0.9 and 1.1 as claimed in claims 3 and 14. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Zhang et al. to use the claimed ranges, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

6. Claims 19 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al. as applied to claim 12 above, and further in view of Shimizu et al. ('910). Zhang et al. meets the additional limitations of the claims for the reasons given above regarding claim 12, except it does not show moving said slider when the disk surface is flat with said slider aligned at a bias angle, nor radially moving said slider toward said track when the disk surface is bent, by said lever action through said principal axis at said bias angle causing said slider to move radially toward the track, when said disk surface is bent.

Shimizu et al. Figures 5-9 and 14 show moving said slider when the disk surface is flat with said slider aligned at a bias angle (9), and radially moving said slider toward said track when the disk surface is bent, by said lever action through said principal axis at said bias angle causing said slider to move radially toward the track, when said disk surface is bent (Figures 6-7 and 14), for the purpose of reducing positioning error due to fluctuation of the magnetic disk. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Zhang et al. to enable use of the teaching of Shimizu et al. of moving the slider by lever action through the principle axis at a bias angle causing the slider to move radially toward the track, the motivation being to reduce positioning error due to fluctuation of the magnetic disk.

7. Claims 7-10 and 20-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter:

Claims 20-21 are allowable over the prior art of record since the cited references taken individually or in combination fails to particularly disclose a method of controlling a voice coil in a hard disk drive comprising said flexure responding as said disk surface is bent through said second bias angle causing said slider to move radially toward said track, and presented in the environment of claim 2. It is noted that the closest prior art, Shimizu et al., shows bending through a first bias angle causing said slider to move radially toward said track similar to the claimed invention. However, Shimizu et al. fails to disclose said flexure responding as said disk surface is bent through said second bias angle causing said slider to move radially toward said track as claimed.

Claim 7 is allowable over the prior art of record since the cited references taken individually or in combination fails to particularly disclose a mechanism controlling a voice coil comprising means for radially moving said slider toward said track when said disk surface is bent, by said lever action through said principal axis at said bias angle causing said slider to move radially toward said track, when said disk surface is bent, as disclosed in Figures 8A-11D and specification page 9, lines 25-29 and p. 12, line 5 through p. 13, line 6, and presented in the environment of claim 7. It is noted that the closest prior art, Shimizu et al., shows bending through a first bias angle causing said slider to move radially toward said track similar to the claimed invention. However, Shimizu et al. fails to disclose means for radially moving said slider toward said track when said disk surface is bent, by said lever action through said principal axis at said bias angle causing said slider to move radially toward said track, when said disk surface is bent as claimed.

Art Unit: 2651

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ono Figures 1-4 and Shinohara et al. Figure 7 shows adjusting gains in the servo controller similar to applicant's invention. Guo et al. Figures 2 and 6-7 show a gimbal assembly for minimizing head off-track due to disk flutter similar to applicant's invention.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James L Habermehl whose telephone number is (703)305-6975. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (703)305-4040. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Habermehl/jlh
19 Jan 05


SINH TRAN
SUPERVISORY PATENT EXAMINER
MINER